

Keys To The Cohasset Water System

The Aaron River Dam is an earthfill dam approximately 900 feet long and approximately 25 feet high.

An impervious fill cutoff wall prevents seepage beneath the dam structure and a concrete ogee spillway protects the dam from overtopping under flood conditions. The Reservoir created by the dam holds about 323 million gallons of water and has a surface area of about 150 acres, 129 of which lie within

Wampatuck State Park.

A fish ladder has been constructed at the dam to allow fish to migrate to and from the reservoir. The dam contains approximately 57,000 cubic yards of various types of fill material including 40,000 cubic yards of impervious fill material for the core.

Permanent monitoring wells have been installed to observe water level fluctuations both upstream and downstream of the dam. Water level is

controlled by a weir gate at the entrance to the fish ladder. A low level outlet pipe is used only to drain the reservoir in emergencies or for maintenance.

In addition to the concrete ogee overflow spillway, an earthen emergency spillway protects the dam from overtopping during periods of very high rainfall and runoff.

The construction cost of the dam and reservoir was \$900,000, Arthur Scholfield Inc., contractor.

BOUND BROOK CONTROL STRUCTURE

The Bound Brook Control Structure is a reinforced concrete structure at the Beechwood Street bridge which provides control of the water surface elevation in Lily Pond by means of adjustable gates.

It is designed to maintain the water level in Lily Pond between elevations 42 and 45 and has a hydraulic capacity of 600 cubic feet per second. A fish ladder was also incorporated into the design and construction to encourage the eventual introduction of fish runs from the Atlantic Ocean to the new Aaron River Reservoir.

It is required that a minimum flow of 1 cubic foot per second be maintained at all times in Bound Brook below the control structure. In order to provide for this requirement, and to supplement the water supply in Lily Pond for the water treatment facility, releases of water will be made from the Aaron River Dam during periods of low precipitation and runoff.

The control structure at Bound Brook diverts this released water to Lily Pond by adjustment of the movable weir gates. The stream channels upstream of the control structure, including Bound Brook and Herring Brook, were excavated to provide increased flow capacity from the dam to the control structure.

The construction cost for the Bound Brook Control Structure was \$43,000, Jay M. Cashman Inc., contractor.

WATER TREATMENT FACILITY

The Cohasset Water Treatment Facility is designed to treat an average flow of 1.2 million gallons per day and a peak flow of 3.0 million gallons per day.

The treatment process includes fine and coarse screening, rapid mixing, flocculation, settling, filtration, pre- and post-chlorination, fluoridation, and chemical addition for coagulation and pH adjustment. A laboratory and control room are located on the upper level of the treatment plant.

The building also houses administrative offices for the Cohasset Water Department consisting of a secretarial office, superintendent's office, conference room, personnel room, and engineering office.

A natural gas-powered standby electric generator, five bay garage and two sludge lagoons are located on the site separate from the main building.

The construction cost for the treatment facility, garage, and sludge lagoons was \$1,900,000, A. Bonfatti & Co. Inc., contractor.

HOW COHASSET'S WATER IS PURIFIED

Cohasset's new water treatment facility employs the lat-

est technological advancements in water treatment. Here is the step-by-step process:

Raw water from Lily Pond flows to the intake structure containing coarse and fine screens and upon entering the plant passes through a flow metering and control device. This metering device, in addition to measuring the quantity of flow, also provides an automatic signal for controlling amounts of chemicals fed into the water.

Coagulating chemicals are added to the water in rapid mix tanks and are rapidly and thoroughly mixed in the water.

The chemically treated water then flows to flocculation units where the tiny coagulated particles are brought into contact with each other by slowly revolving paddles. This causes the particles to cling to each other, or "floc", and thus to increase in size so that they will settle more rapidly in the sedimentation units.

In the sedimentation units, the water is held for a sufficient time to allow the floc to settle. The clarified water then passes on to the filters. The settled particles are removed by mechanical equipment to sludge lagoons for dewatering. The water from the lagoons is then returned to the pond and sludge is removed to a disposal area.

The filters consist of a 30-inch layered bed of two materials, each of different particle size and density: anthracite coal and silica sand.

These materials provide a gradation of particle size from coarse to fine in the direction of a flow through the filter. The filter bed rests on a 10-inch gravel layer.

After the water passed through the filters it moves to a clear well or filtered water reservoir. There it is chlorinated and pumped into the town's water distribution system. If the rate of output of the treatment plant exceeds the rate of consumption, the water is pumped to the standpipe on the top of Bear Hill where it is stored for use during periods of peak demand.

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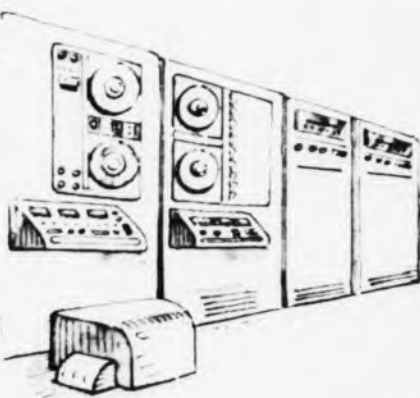
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